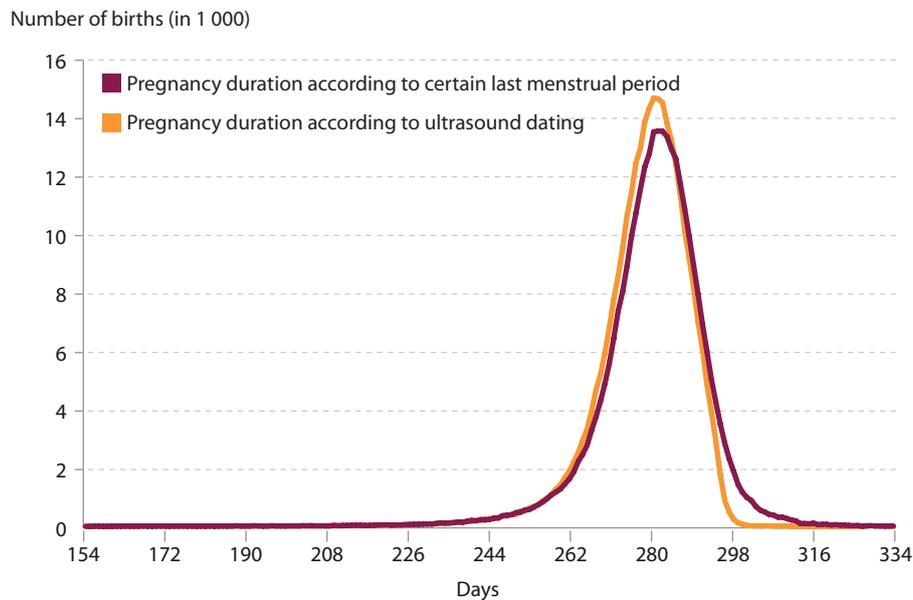


The duration of a pregnancy is subject to variation in line with all other biological variation. We should distinguish more clearly between fetal age and the predicted date of delivery.

How long does a pregnancy last?



Variation in pregnancy duration in 309 749 singleton pregnancies according to certain LMP (red line) and spontaneous start of labour in 1999–2010 (median length 283 days). The yellow line shows the distribution for the same pregnancies, but based on ultrasound dating (median estimated pregnancy duration 281 days). Data from the Medical Birth Registry of Norway

Moses wandered in the desert for 40 years, fasts could last up to 40 days and in the tale of Ali Baba there were 40 thieves. The number 40 has played a special role in religion, tradition and culture. It is not surprising that the idea of a 40 week gestational period gradually became entrenched as the need for more exact knowledge gave rise to Nägele's rule early in the 19th century: a pregnancy lasts for 10 menstrual cycles calculated from the first day of the last menstrual period (LMP), i.e. 7 days \times 4 \times 10 = 280 days or 40 weeks. Today the World Health Organisation (WHO) also defines pregnancy duration as 40 weeks. But is this correct? Closer examination shows that in Scandinavia a pregnancy lasts on average 1–3 days longer than 40 weeks, calculated from the first day of the last menstrual period (1–3).

Using the first day of the LMP to determine pregnancy duration is an indirect method that assumes that fertilisation took place on day 14 with several uncertain factors such as length of menstrual cycle, time of ovulation and fertilisation, time of implantation and the woman's memory. Roughly 50% of pregnant women do not have a sufficiently regular menstrual cycle or good enough information to allow the calculation of a reliable fetal age (4). Hence measuring fetal size using ultrasound is an alternative method. Based on the pre-condition that biological variation is small in the early period of pregnancy, fetal size is used to determine gestational age. According to this method, the median for pregnancy duration is 40 weeks and 0–1 day – somewhat shorter than if calculated according to the LMP (2–3).

In fact only approximately 4% of pregnant women give birth on the predicted date of delivery (5). This can be accounted for by both methodological and biological variation. Fetuses with slow growth

tend to cause longer pregnancy duration while the opposite is the case for large fetuses (6). Boys born to fathers who themselves had a high birth weight are often bigger and the pregnancy has a shorter duration (7). Hence there are gender differences and hereditary mechanisms. Parents who themselves were born after a post-term gestational period are more likely to experience the same with their children (8). Overall, the variation is so considerable that all those born within a pregnancy duration of 37–42 weeks are deemed to be born within a normal time range around the estimated date of delivery. This variation contrasts sharply with the keenness often shown by medical expertise to have uniform pregnancy duration and an exact date of delivery. The public often have unrealistic expectations as to the date of delivery, which are seldom fulfilled.

Knowing the correct fetal age is crucial for treatment and monitoring during the pregnancy: chorionic villus sampling (CVS) after week 10, targeted diagnostic testing in weeks 11–13, amniocentesis after week 15, routine ultrasound examination at 18 weeks, discussion of viability and delivery after 24 weeks, lung maturity injection prior to 34 weeks. Children born prior to 37 weeks are considered premature and after 42 weeks post-term. Fetal age reflects fetal development and is a key determinant of morbidity and perinatal death. Therefore all available information must be included to determine fetal age as correctly as possible. However, it has become customary to use only routine ultrasound examination, which entails a simplification of routines and which predicts the date of a spontaneous birth better than when this is based on even a certain and regular last menstrual period (5).

This accuracy is partly explained by the fact that reliable menstrual factors do not reflect the time of conception sufficiently well, and

that ultrasound measurement compensates for this. Another factor is natural variation linked to the correlation between fetal growth and pregnancy duration. If the fetus shows slower than average growth, the fetal age will be adjusted downwards accordingly when ultrasound examination is conducted after 18 weeks, and the estimated date of delivery will be moved back. Physiologically small fetuses have a longer gestational period (6). Ultrasound examination will then be more accurate than using the last menstrual period as a basis. In such cases two errors are made: the fetus has been assigned too low an age and biological variation in pregnancy duration has not been taken into account. If this pregnancy had lasted 42 weeks in relation to the date of delivery determined by the ultrasound examination, it would have actually lasted 43 weeks. It is not difficult to understand the consequences of this in a country where there is a heated debate on post-term pregnancies. On the other hand, if one accepts that a slow-growing fetus where there is correct information about the mother's menstrual period really was 18 weeks old, and at the same time acknowledged that the ultrasound method predicts the time of delivery more accurately, the mother could be informed of the fetal age and at the same time prepared for a possibly longer pregnancy, i.e. date of delivery after more than 40 weeks. This way of thinking may seem alien to many people because the notion of a fixed pregnancy duration for everyone is firmly instilled. However, viewing normal pregnancy in this way also makes it possible to look at pregnancy outcomes with different eyes at 42 weeks.

In other words, the duration of pregnancy is subject to variation in the same way as other kinds of biological variation. By appreciating the value of this variation and utilising it in care during pregnancy we are more in harmony with biology. But then we must also distinguish between determination of fetal age, which can be done in a variety of ways, and date of delivery, where ultrasound examination can indicate the likely date of delivery.

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Reported conflicts of interest: None declared

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